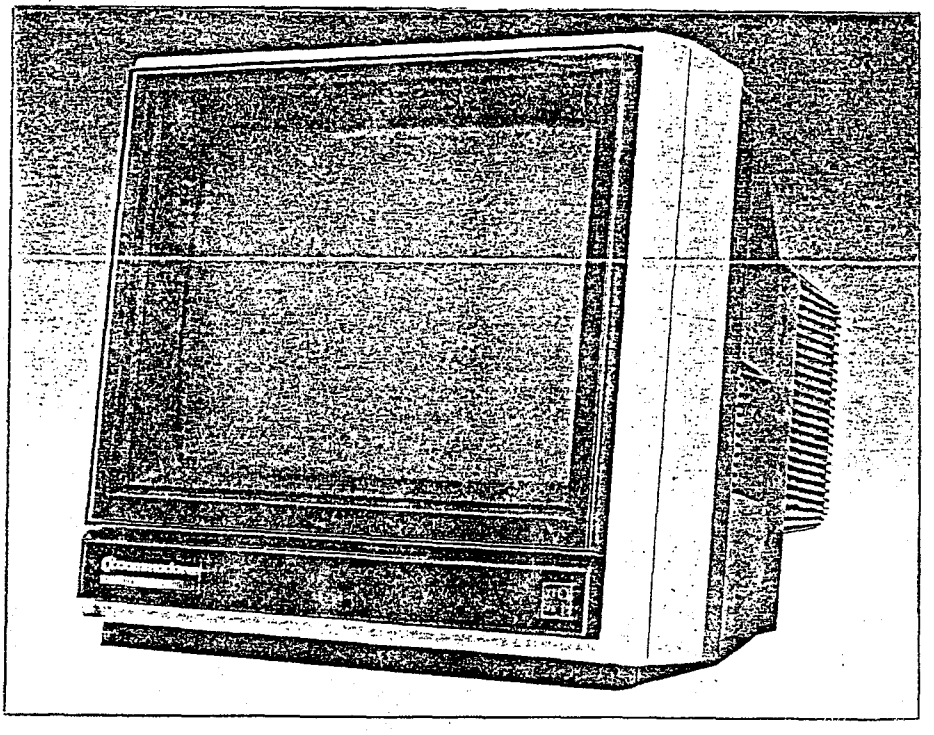
SERVICE MANUAL

commodore

COLOR DISPLAY MONITOR

MODEL 1801



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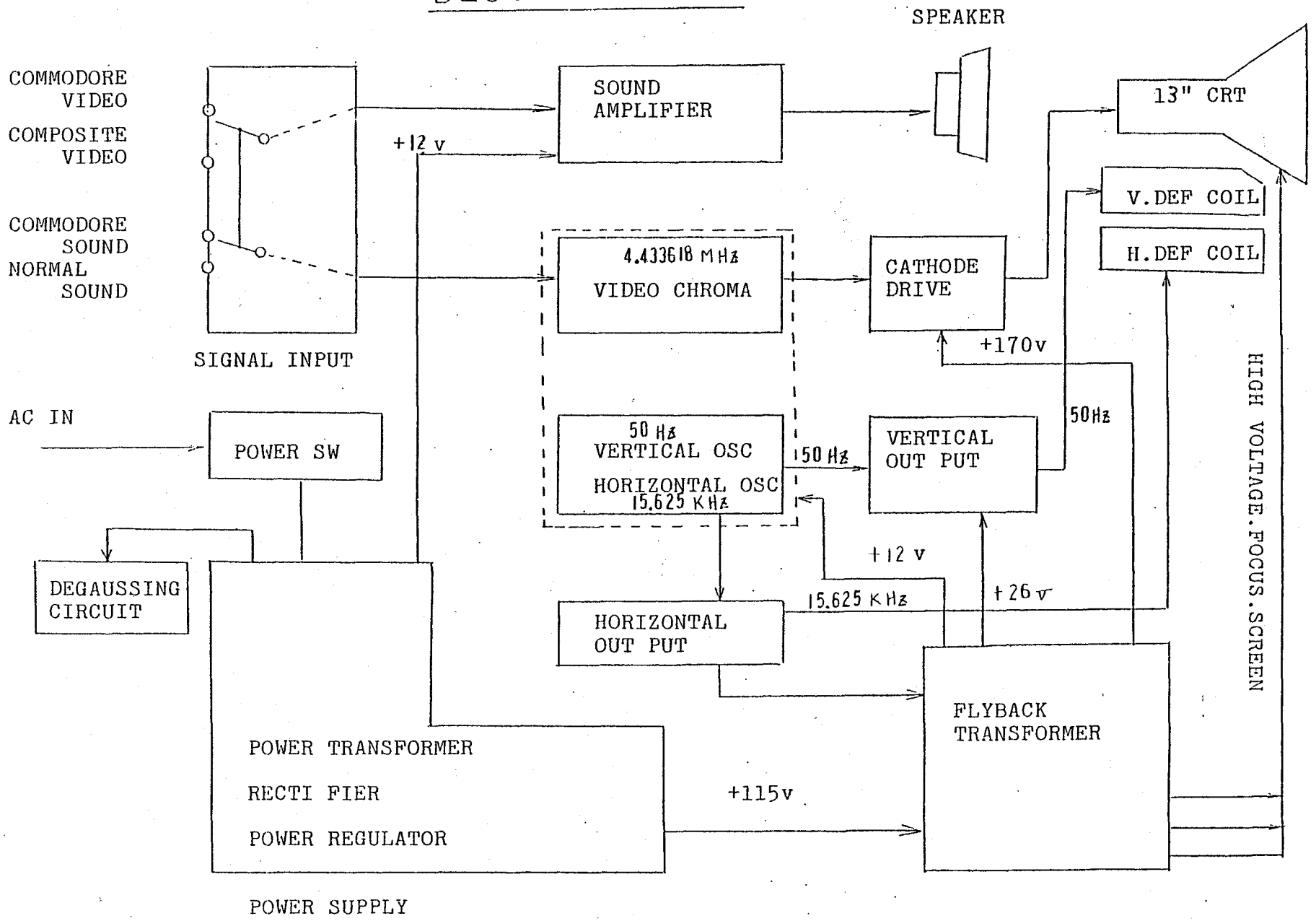
Specifications

Input Signals	a.Data Signals 1.0±0.5V p-p 1.0 ± 0.5V p-p 75 ohm . Commodore Video Signal *Chroma Signal *Luminance Signal . Composite Video Signal Selected by front switch. b.Sound Signal 1.0 V rms . Commodore Sound . Normal Sound Selected by front switch.
CRT Size	33.5 cm dig. (13 inch diag)
Semiconductors	IC 4pcs. Transistor 9pcs. Diodes 13pcs.
Speaker	7.5cm round type 1pcs.
Display Format	1000 Characters (5X7 dot. 40 chara. 25 line)
Scanning Frequency	Horizontal 15.625 K HZ Verticai 50 HZ
Power Input	AC220V (VDE) AC240V (BSI) 50/60HZ
Power Consumption	65W
Dimensions	370(w) x 337 (H) x 420 (D) cm
Weight	14 Kg

*Specifications are subject to change without notice

BLOCK DIAGRAM



SAFETY PRECAUTIONS

WARNING

1. Comply with all caution and safety-related notes provided on cabinet back, inside the cabinet, on the chassis or the picture tube.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as; control knobs, adjustment covers or shields barriers, isolation resistor-capacitor networks etc.

   DO NOT OPERATE THIS TELEVISION RECEIVER WITHOUT THE PROTECTIVE SHIELD IN POSITION AND PROPERLY SECURED.
3. Before replacing the back cover of the set, thoroughly inspect inside the cabinet to see that no stray parts or tools have been left inside.

Before returning any television to the customer, the service technician must perform the following safety checks and be sure that it is completely safe to operate without danger of electrical shock.

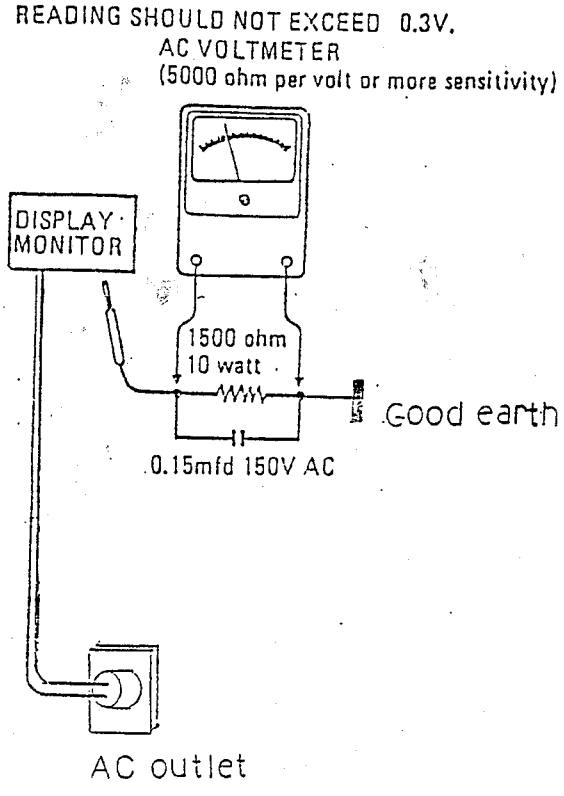
TERMINAL COLD CHECK

With the AC plug removed from the AC outlet, place a jumper across the two blades. Turn the television AC switch on. Using an ohmmeter, connect one lead to the jumpered AC plug and touch the other lead to each exposed video and sound connectors. The resistance must measure between 1M ohm and 5.2M ohm. Any resistance value below or above this range indicates an abnormality which requires corrective action. Repeat the test with the AC switch in the OFF position.

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sesitivity. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a good earth and all exposed metal parts of the cabinet.

Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must first be located and corrected.
Repeat the above test with the receiver power plug reversed.
NEVER RETURN A RECEIVER TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.



X-RADIATION PRECAUTIONS

The primary source of X-RADIATION in a solid-state television receiver is the picture tube. The picture tube is specially constructed to limit X-RADIATION emissions. For continued X-RADIATION protection, the replacement tube must be the same type as the original including suffix letter. Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specified limits. Refer to the X-RADIATION WARNING NOTE ... in this service manual for specific high voltage limits.

PRODUCT SAFETY NOTICE

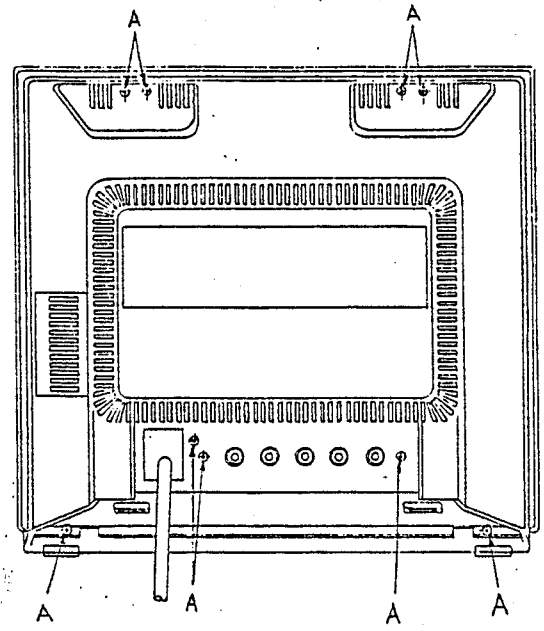
Many electrical and mechanical parts in Color Display Monitor have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them be necessarily increased by using replacements rated for higher voltage, wattage, etc.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and "▭" in the Recommended Parts List and Schematic Diagrams. For continued protection, replacement parts must be identical to those used in the original circuit. The use of a substiture replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

MECHANICAL DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to below figure remove screws-A (9 screws).
2. Pull cabinet back off, then remove speaker socket and remove cabinet back completely.



CABINET FRONT WITH PICTURE TUBE REMOVAL

Remove "Cabinet Back" refer to "Cabinet Back Removal".
Disconnect CRT socket, deflection socket, LED socket, power switch socket, degaussing socket, picture tube grounding lead and 2nd anode lead.
Pull cabinet front with picture tube off, then remove cabinet front with picture tube completely.

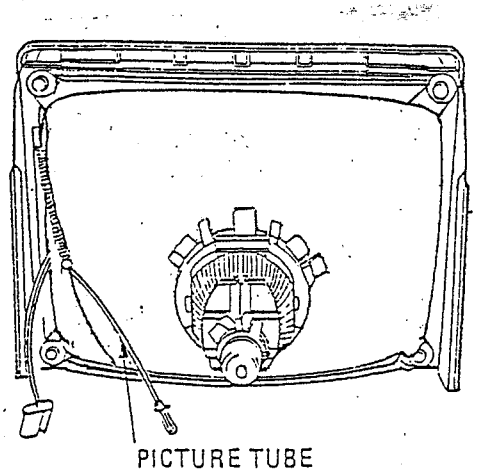
CHASSIS REMOVAL

1. Remove "Cabinet Back" and "Cabinet Front with Picture Tube", refer to "Cabinet Back Removal" and "Cabinet Front with Picture Tube Removal".
   Remove audio input socket and video input socket
   Push the four hooks outward, then pull out chassis from cabinet base and remove chassis completely.

PICTURE TUBE REMOVAL

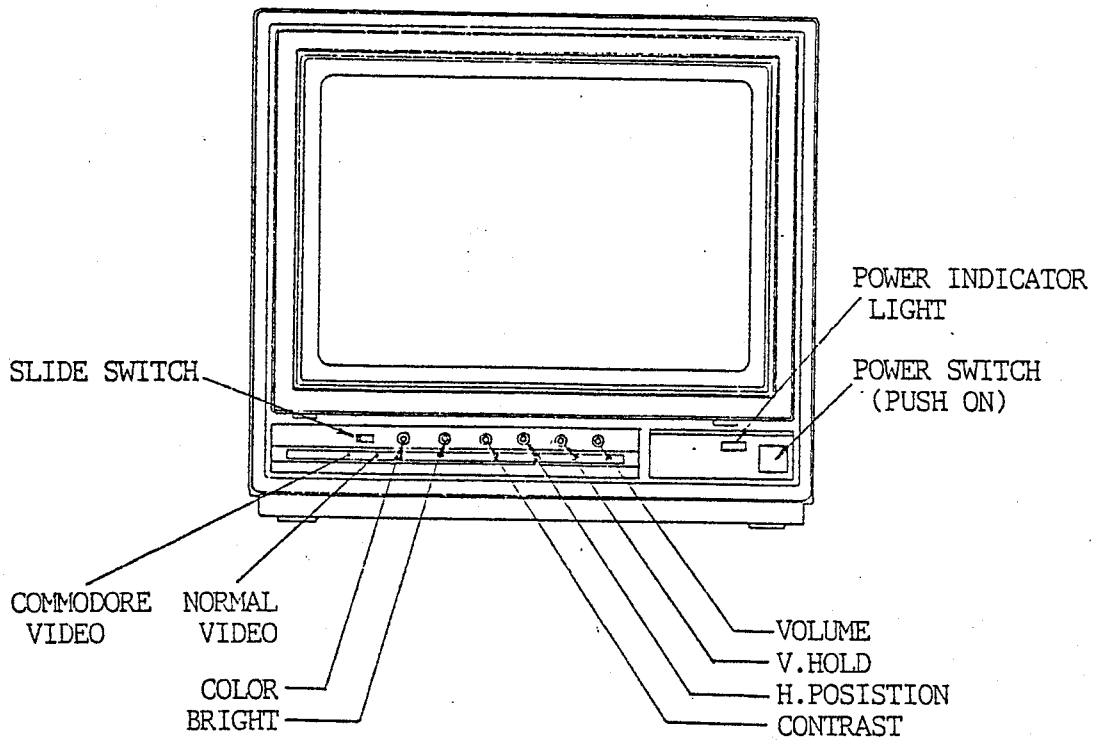
CAUTION: Do not disturb the deflection yoke or magnet assembly on the CRT neck. Care must be taken to keep these assemblies intact, unless CRT is being replaced.
Discharge the CRT to the coating of the tube before handling the tube.

1. Remove "Cabinet Back" and "Cabinet Front with Picture Tube", refer to "Cabinet Back Removal" and "Cabinet Front with Picture Tube Removal".
2. Place cabinet front face down on a soft surface.
3. Remove screw on each corner of the CRT.
   GENTLY taken out the CRT from cabinet.
4. Install replacement CRT in reverse order.
   Refer to figure below and install degaussing coil and CRT ground lead properly on CRT.

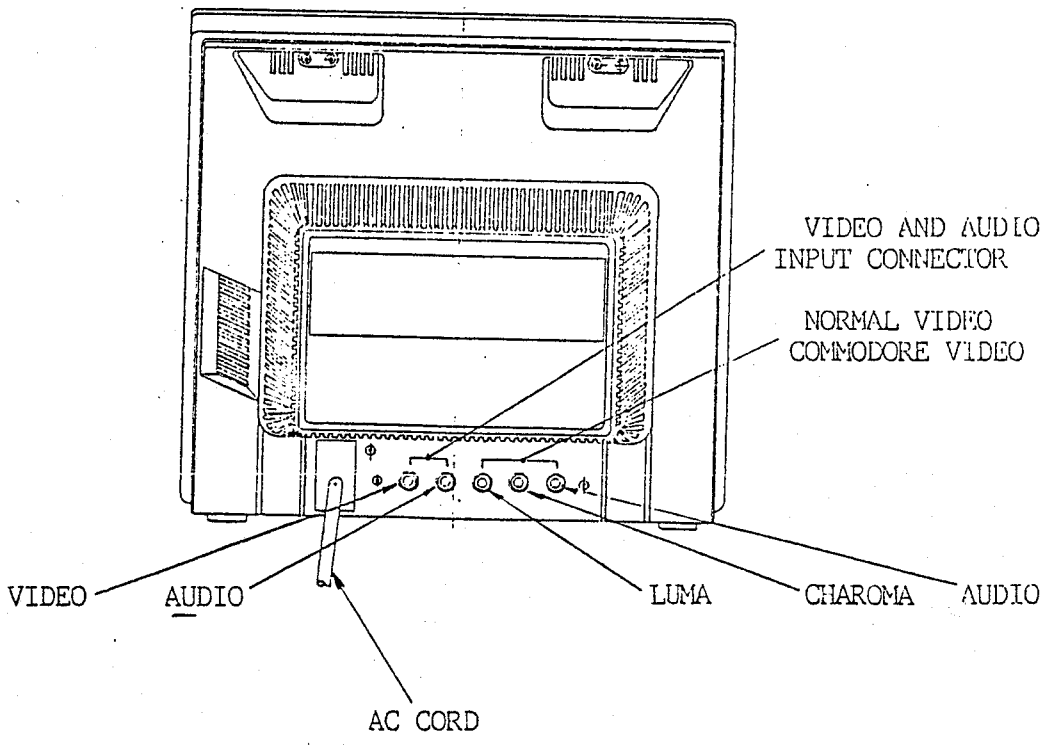


FRONT AND REAR CONTROL VIEWS

FRONT VIEW



REAW VIEW

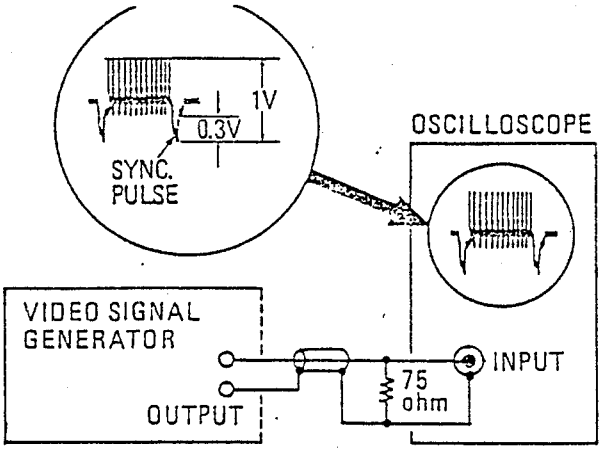


INSTALLATION AND SEVICE ADJUSTMENTS

VIDEO INPUT CONNECT
This set is designed for video signal reception. Input impedance is fixed at 75 ohms.

CIRCUIT PROTECTION
A Fuse(1.25A)is included in the AC line and fuse(1.25A) is included in the +B line. Fuse must be replaced with proper fuse. (See Patrs List in the manual).

PREPARATION STEP
1. Adjust video signal at 1.0 volt p-p from the video signal (color bar /dot crosshatch) generater (See below).



2. Connect video signal (color bar/ dot crosshatch) generator output to "VIDEO INPUT" at the rear of the set.

+B (+115V) CHECK
1. Tune receiver to a color bar signal.
2. Set brightness and contrast controls fully counterclockwise. Connect short jumper between "IC301 31-PIN" to "IC301 35PIN" on main signal board.
3. Connect a DC meter between "C107" (Positive lead) and "C107" (negative lead) on main signal board.
4. Voltage must mesuare between +114. 5V to +115.5V, if the voltage is out of this range, power supply sirsuit checked if necessary.

SUB CONTRAST AND SUB BRIGHT

1. Display a picture and set the contrast and bright VRS to the center click Position.
2. Adjust the sub contrast VR(R551) and sub bright VR(R553) for optimum display.

SUB COLOR

1. Display a color video signal.
2. Set the color VR to the center click Position.
3. Adjust the sub color VR(R651) for optimum display.

HOLIZONTAL OSILLATOR ADJUSTMENT

1. Tune receiver to a any signal.
2. Connect a Frequency counter between "IC301 39pin" (Positive lead) and "signal GND" (negative lead) on main signal Board.
3. Adjust H.Frequency control (R351) on main signal Board for 15.625KHZ.

VERTICAL SIZE ADJUSTMENT
Adjust vert. size control (R451) for full scan.

VERTICAL CENTERING ADJUSTMENT
Vertical centering can be adjusted connecting vertical centering adjustment.
(control R453)

FOCUS ADJUSTMENT
Adjust focus control for well defined scanning lines.

BRIGTH LEVEL ADJUSTMENT
NOTE; +B (+115V), High Voltage and Gray Scale should be adjusted before attempting bright level adjustment.
1. Tune receiver to a dot crosshatch signal.
2. Set brightness and contrast controls fully clockwise.
3. Connect a DC meter between "R314" (positive lead) to "R314" (negative lead) on main signal board.
4. Adjust bright level control(R533) on main signal board for 0.06V

GRAY SCALE ADJUSTMENT

1. Set Red (R704) and Green (R705) drive controls for mechanical center of it's range. Set Red (R718), Green (R719) and Blue (R720) bias controls to minimum (fully counter-clockwise).
2. Set screen control to minimum (fully counter-clockwise).
3. Set switch 401 to "SERVICE" position on main signal board.
4. Advance screen control clockwise to obtain just visible one colored line.
5. Advance each bias control to obtain just visible white line.
6. Set service switch to"NORMAL" position on main signal board.
7. Adjust Red and Green drive controls alternately produce normal black and white picture.

NOTE; If gray scale adjustment is made after picture tube replacement, Check high voltage.

PURITY AND CONVERGENCE ADJUSTMENT

CAUTION; Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments. However, the effects of adjacent receiver components, replacement of picture tube or deflection yoke, or through inadvertent loosening of the lock ring may require the need to readjust purity and convergence. If adjustment is required the adjustments should be made in the following sequence.

PURITY ADJUSTMENTS

1. Place the picture tube face north or south and demagnetize the picture tube and receiver using an external degaussing coil. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly, see figures 5 and 6.
2. Turn Red and Blue guns off and provide only Green raster. Rotate Screen control on the Main Signal Board to fully counterclockwise (raster becomes dark). Rotate Red and Blue Bias controls fully counterclockwise. Slowly rotate Green Bias control clockwise to produce Green raster.
3. Loosen the screw holding the Deflection Yoke and slide the Deflection Yoke backward as far as possible, and remove the 3 Rubber Wedges. Loosen Locking Ring (some models).
4. Rotate and spread the Tabs of the two Purity Magnets to center the vertical green belt in the picture screen. The Purity Magnets are also adjusted to obtain vertical centering of the raster.
5. Slowly slide the Deflection Yoke forward until a uniform green screen is obtained.
6. Check the purity of the red and blue screens for uniformity, turn off other colors to check this (use bias controls). Readjust the yoke position if necessary until all screens are pure.
7. Adjust each Bias control and screen control to obtain white raster. Refer to Gray Scale Adjustment. If part of the picture screen is colored, adjust the Deflection Yoke position forward or backward slightly.
8. Tighten the mounting screw of the Deflection Yoke. Adjust Convergence next.

CONVERGENCE ADJUSTMENT

CENTER AREA CONVERGENCE

1. Use a dot-crosshatch pattern signal.
2. Turn Red and Blue guns on and turn off Green gun. Adjust the angle between the Tabs of the Four Pole Magnet 1 and 2, and superimpose the Red and Blue vertical lines in the center area of the picture screen. Refer to figure 3.
3. Keeping the mutual angle of the Tabs of the Four Pole Magnet turn them together to superimpose the Blue and Red horizontal lines in the center area of the picture screen. Refer to figure 3.
4. Turn Green gun on and adjust Six Pole Magnet 3 and 4 so that the Green line superimposes on the Red/Blue lines. This is the same procedure used in steps 2 and 3. Refer to figure 4.

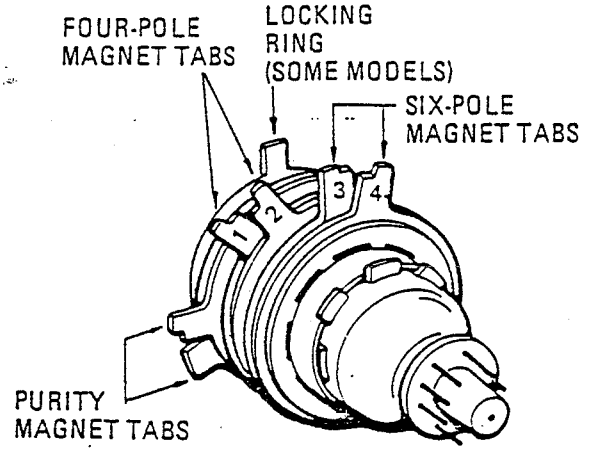


Figure 1 - PURITY AND CONVERGENCE MAGNETS

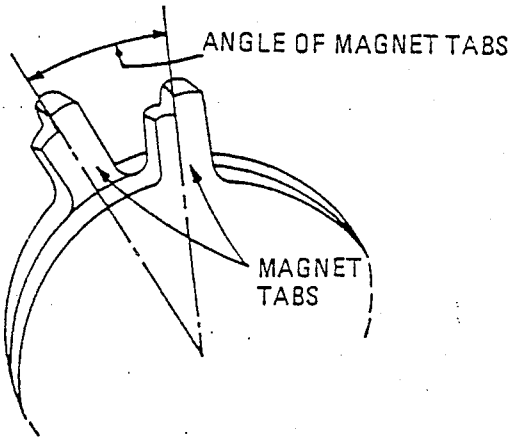
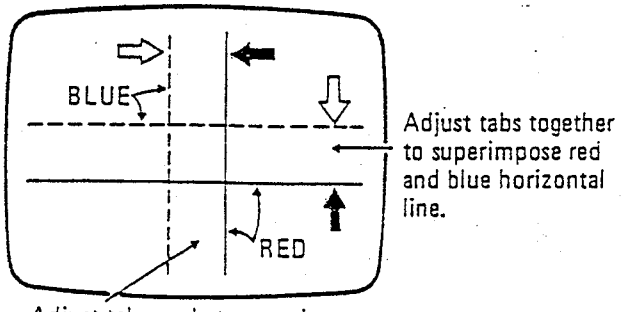
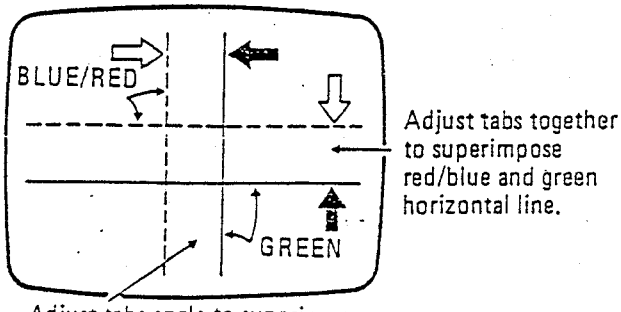


Figure 2 - ADJUSTMENT MAGNET


BLUE
RED
Adjust tabs together to superimpose red and blue horizontal line.
Adjust tabs angle to superimpose blue and red vertical line
Figure 3 - BLUE AND RED LINE MOVEMENT


BLUE/RED
GREEN
Adjust tabs together to superimpose red/blue and green horizontal line.
Adjust tabs angle to superimpose red/blue and green vertical line.
Figure 4 - BLUE/RED AND GREEN LINE MOVEMENT

CONVERGENCE FOR OUTER AREA

1. Slightly loosen the screw holding the Deflection Yoke. Refer to figure 6.
2. Adjust the Deflection Yoke to converge the detail in the outer area of the picture screen by orbital movement of the front of the Yoke, then secure the Deflection Yoke in appropriate position by putting the wedges as illustrated. Refer to figure 6 and 7. Tighten screw holding the Deflection Yoke.

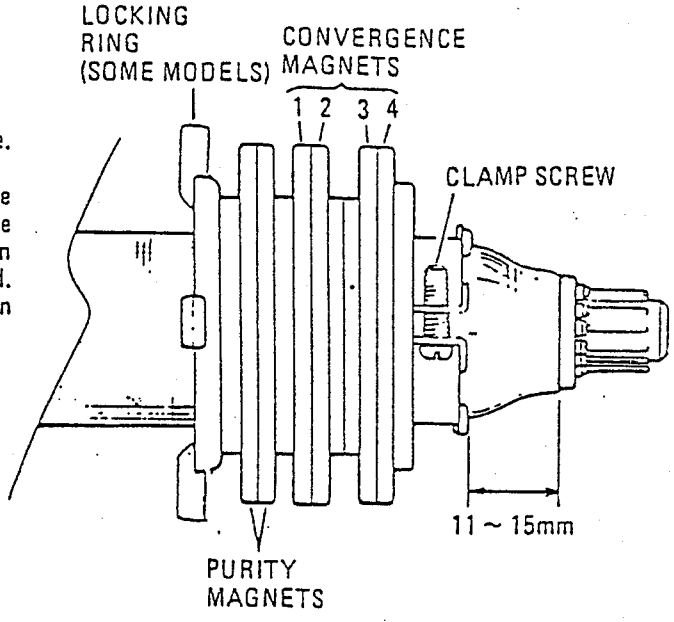


Figure 5 - CONVERGENCE AND PURITY MAGNETS ASSEMBLY POSITIONING

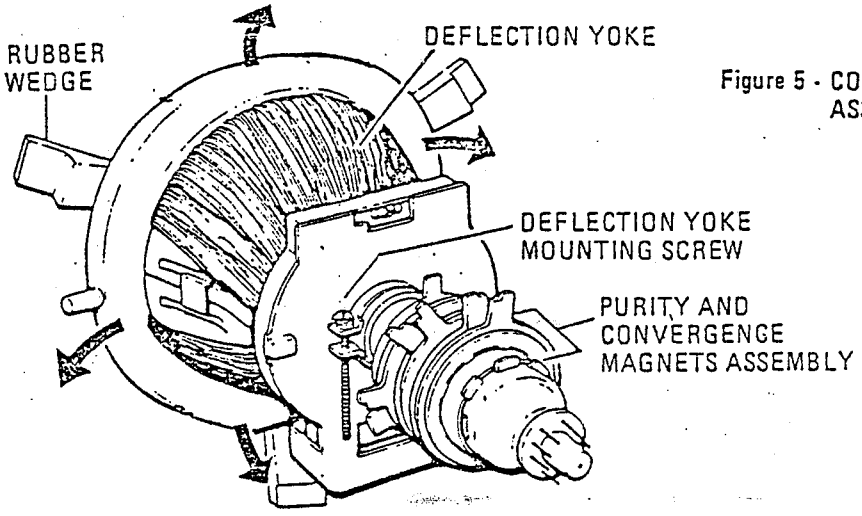
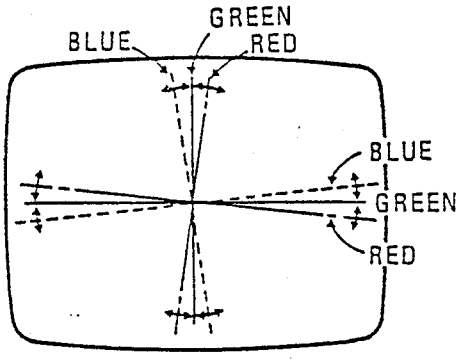
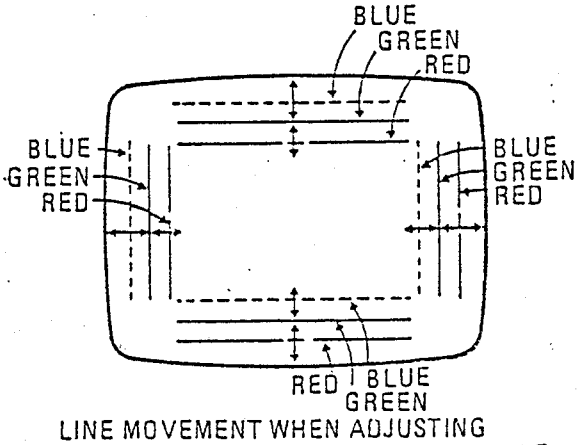


Figure 6 - ADJUSTMENT DEFLECTION YOKE



LINE MOVEMENT WHEN ADJUSTING DEFLECTION YOKE FRONT UP AND DOWN

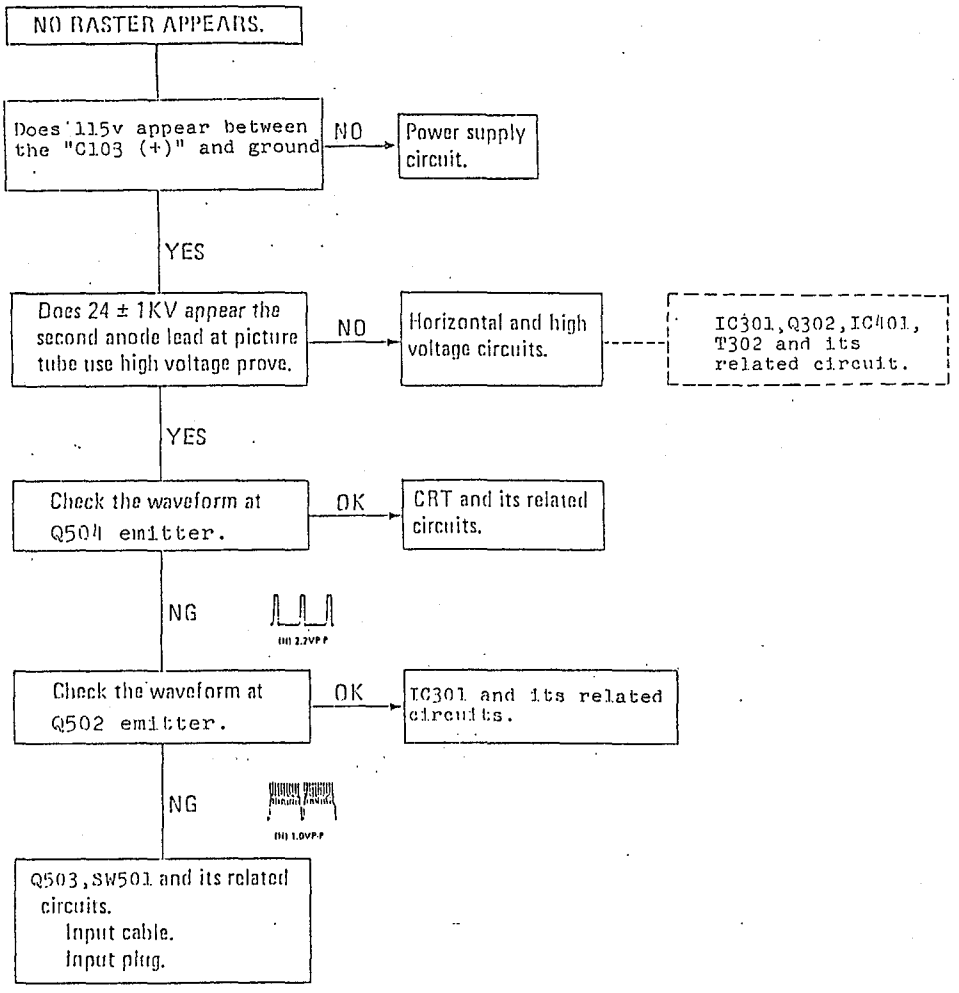


LINE MOVEMENT WHEN ADJUSTING DEFLECTION YOKE FRONT SIDE TO SIDE

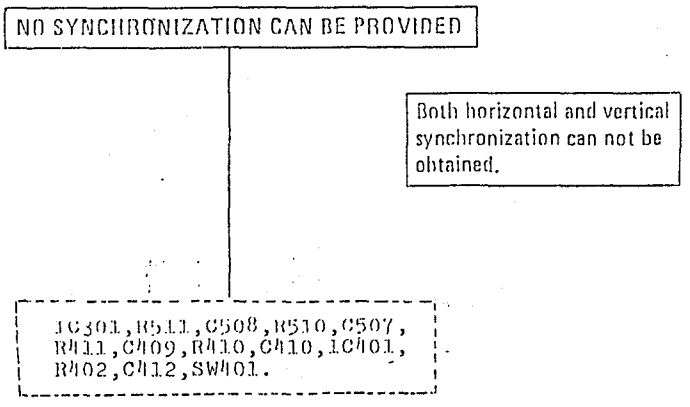
Figure 7 - LINES MOVEMENT

TROUBLESHOOTING TABLE

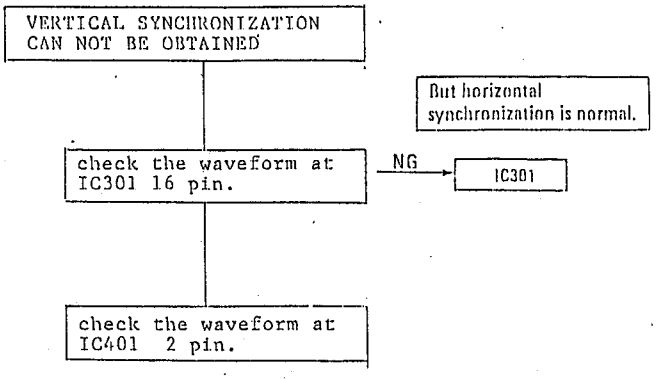
Circuit Checked:
1. No raster appears.
   - Power supply circuit.
   - Horizontal and high voltage circuits.
2. A high voltage develops but no raster appears.
   - CRT circuit.
   - Video circuit.



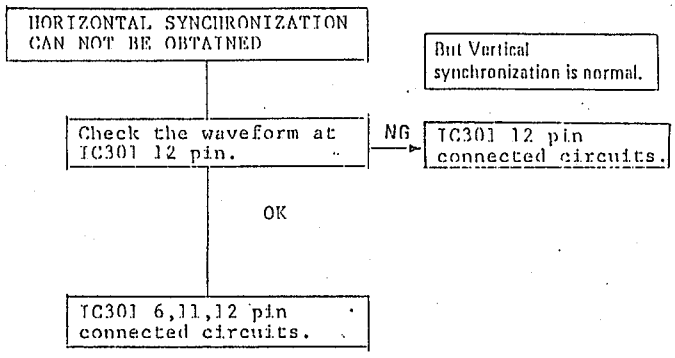
Circuit Checked:
.IC301,IC401 and its related circuits.

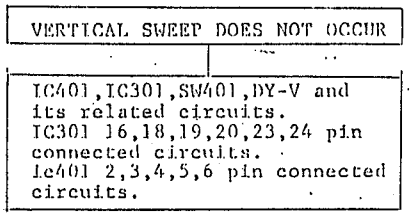

NO SYNCHRONIZATION CAN BE PROVIDED
Both horizontal and vertical synchronization can not be obtained.
IC301,R511,C508,R510,C507, R411,C409,R410,C410,IC401, R402,C412,SW401.

Circuit Checked:
.IC301,IC401 and its related circuits.

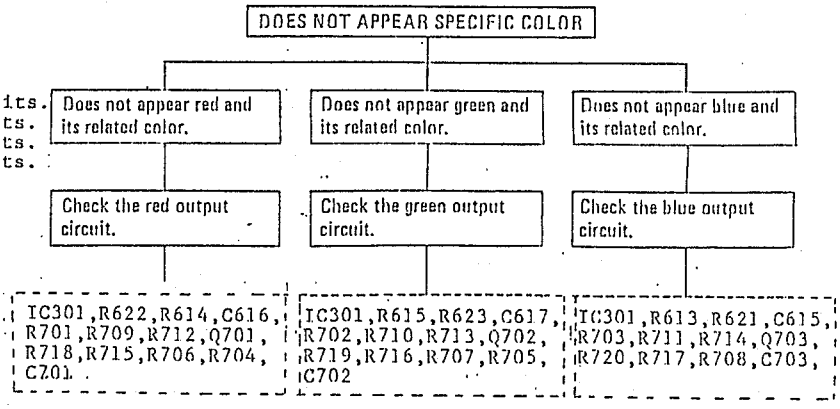

VERTICAL SYNCHRONIZATION CAN NOT BE OBTAINED
But horizontal synchronization is normal.
check the waveform at IC301 16 pin.
NG
IC301
check the waveform at IC401 2 pin.

Circuit Checked:
.IC301 and its related circuits


HORIZONTAL SYNCHRONIZATION CAN NOT BE OBTAINED
But Vertical synchronization is normal.
Check the waveform at IC301 12 pin.
NG
IC301 12 pin connected circuits.
OK
IC301 6,11,12 pin connected circuits.


VERTICAL SWEEP DOES NOT OCCUR
IC401,IC301,SW401,DY-V and its related circuits.
IC301 16,18,19,20,23,24 pin connected circuits.
Ic401 2,3,4,5,6 pin connected circuits.

Circuit Checked:
.IC301 and its related circuits.
.Q701 and its related circuits.
.Q702 and its related circuits.
.Q703 and its related circuits.


DOES NOT APPEAR SPECIFIC COLOR
Does not appear red and its related color.
Does not appear green and its related color.
Does not appear blue and its related color.
Check the red output circuit.
Check the green output circuit.
Check the blue output circuit.
IC301,R622,R614,C616, R701,R709,R712,Q701, R718,R715,R706,R704, C701
IC301,R615,R623,C617, R702,R710,R713,Q702, R719,R716,R707,R705, C702
IC301,R613,R621,C615, R703,R711,R714,Q703, R720,R717,R708,C703,

TROUBLESHOOTING TABLE

Circuit Checked:
1. No raster appears.
   - Power supply circuit.
   - Horizontal and high voltage circuits.
2. A high voltage develops but no raster appears.
   - CRT circuit.
   - Video circuit.

NO RASTER APPEARS.

Does 115v appear between the "C103 (+)" and ground — NO → Power supply circuit.

YES

Does 24 ± 1KV appear the second anode lead at picture tube use high voltage prove. — NO → Horizontal and high voltage circuits. ---- IC301,Q302,IC401, T302 and its related circuit.

YES

Check the waveform at Q504 emitter. — OK → CRT and its related circuits.

NG

Check the waveform at Q502 emitter. — OK → IC301 and its related circuits.

NG

Q503,SW501 and its related circuits.
- Input cable.
- Input plug.

Circuit Checked:
.IC301,IC401 and its related circuits.

NO SYNCHRONIZATION CAN BE PROVIDED

Both horizontal and vertical synchronization can not be obtained.

IC301,R511,C508,R510,C507, R411,C409,R410,C410,IC401, R402,C412,SW401.

Circuit Checked:
.IC301,IC401 and its related circuits.

VERTICAL SYNCHRONIZATION CAN NOT BE OBTAINED

But horizontal synchronization is normal.

check the waveform at IC301 16 pin. —NG→ IC301

check the waveform at IC401 2 pin.

Circuit Checked:
.IC301 and its related circuits

HORIZONTAL SYNCHRONIZATION CAN NOT BE OBTAINED

But Vertical synchronization is normal.

Check the waveform at IC301 12 pin. —NG→ IC301 12 pin connected circuits.

OK

IC301 6,11,12 pin connected circuits.

VERTICAL SWEEP DOES NOT OCCUR

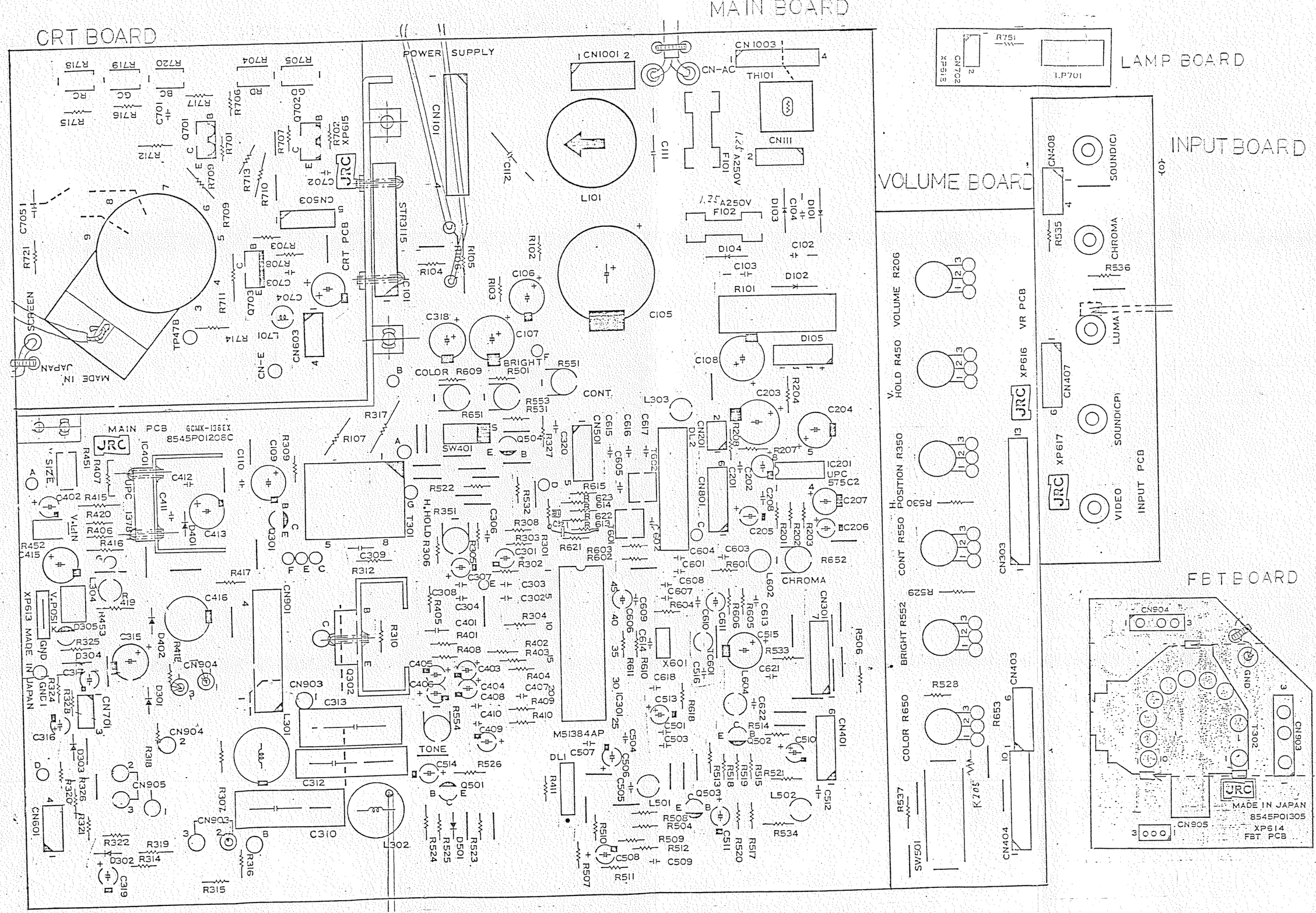
IC401,IC301,SW401,DY-V and its related circuits.
IC301 16,18,19,20,23,24 pin connected circuits.
ic401 2,3,4,5,6 pin connected circuits.

Circuit Checked:
.IC301 and its related circuits.
.Q701 and its related circuits.
.Q702 and its related circuits.
.Q703 and its related circuits.

DOES NOT APPEAR SPECIFIC COLOR

Does not appear red and its related color.	Does not appear green and its related color.	Does not appear blue and its related color.
Check the red output circuit.	Check the green output circuit.	Check the blue output circuit.
IC301,R622,R614,C616, R701,R709,R712,Q701, R718,R715,R706,R704, C701	IC301,R615,R623,C617, R702,R710,R713,Q702, R719,R716,R707,R705, C702	IC301,R613,R621,C615, R703,R711,R714,Q703, R720,R717,R708,C703,

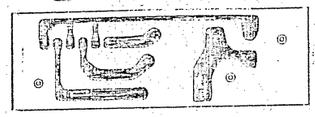
COMPONENT LOCATIONS



PRINTED WIRING DIAGRAM

MAIN BOARD

LAMP BOARD



INPUT BOARD

VOLUME BOARD

FBT BOARD

SCHEMATIC DIAGRAM

PRODUCT SAFETY NOTICE

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and "▭" in the Recommended Parts List and Schematic Diagrams. For continued protection, replacement parts must be identical to those used in the original circuit. The use of a substiture replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

X-RADIATION WARNING NOTE

THIS TV CONTAINS CRITOCAL PARTS TO PROTECT AGAINST X-RADITION NOMINAL 2ND ANODE VOLTAGE IS 24.0 KV AT ZERO BEAM CURRENT AT 220V OR 240V AC LINE,AND MUST NOT EXCEED 25.0 KV UNDER ANY OPERATING CONDITION.

NOTES ON SCHEMATIC DIAGRAMS.

1. Unless otherwise noted in schematic voltage reading taken with "DPM" from point indicated to chassis ground. Voltage reading taken using a video color bar signal, all controls at normal. Line voltage 240 volts.
2. Waveforms were taken with video color bar signal and controls adjusted for normal picture.
3. Resistor/Capacitor Representation;

Resistor	Unit:	No indication ... Ω K ... KΩ M ... MΩ
	Power rating:	No indication ... 1/4W
Capacitor	Unit:	No indication or μ ... μF P ... pF
	Rated voltage:	No indication ... 50V

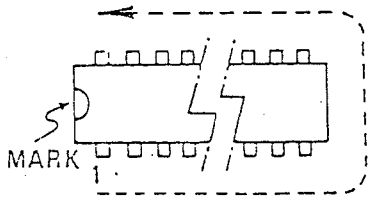
4. The symbol indicates fusible resistors. They protect the circuit from possible damage by short circuits.

SERVICE NOTES:

1. When replacing parts on circuit boards, clamp the lead wires to terminals before soldering.
2. When replacing high wattage resistors on circuit board, keep the resistor body 10 mm (1/2") from circuit board.
3. Keep wires away from high voltage and high temperature components.

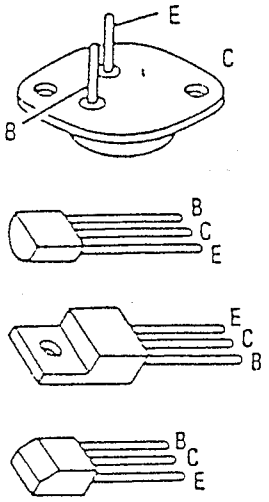
SEMICONDUCTORS BASING

INTEGRATED CIRCUIT



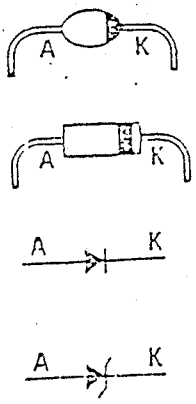
Viewed from IC top

TRANSISTORS



B – BASE
C – COLLECTOR
E – EMITTER
K – KATHODE
A – ANODE

DIODES



PARTS LIST AND RECOMMENDED PARTS LIST

Components marked with a (⚠) have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 4 of this Service Manual. Don't degrade the safety of the set through improper servicing.

Schematic Location	Model No	Description
	PICTURE TUBE	
⚠	CRT	370JWB22P
⚠	DEFLECTION COIL 4455P00198	
	CONVERGENCE MAGNET 4645P00417	
⚠P101	Pii-H03VVH2F 2-VCTFK-LD-BS	
⚠TH101	901P52E100NP12 or ERP-F5B0M120G	
	HPS0171	CRT SOCKET
X601	NC-18/u	4.433MHZ
SW401	EVQ-RBAL10	
⚠SW101	3107E00417-A	Power SW
L701	EL0606SKI-271K	
⚠L102	N 14	Degaussing coil
SW501	SSB042	Slid SW
LP701	LT-9015D	LED
⚠SP101	4285P00003	Speaker
	PRINTED CIRCUIT BOAD	
	XP618	LAMP PCB
	XP615	CRT PCB
	XP616	VOLUME PCB
	XP613	MAIN PCB
	XP617	IN PUT PCB
	XP614	FBT PCB

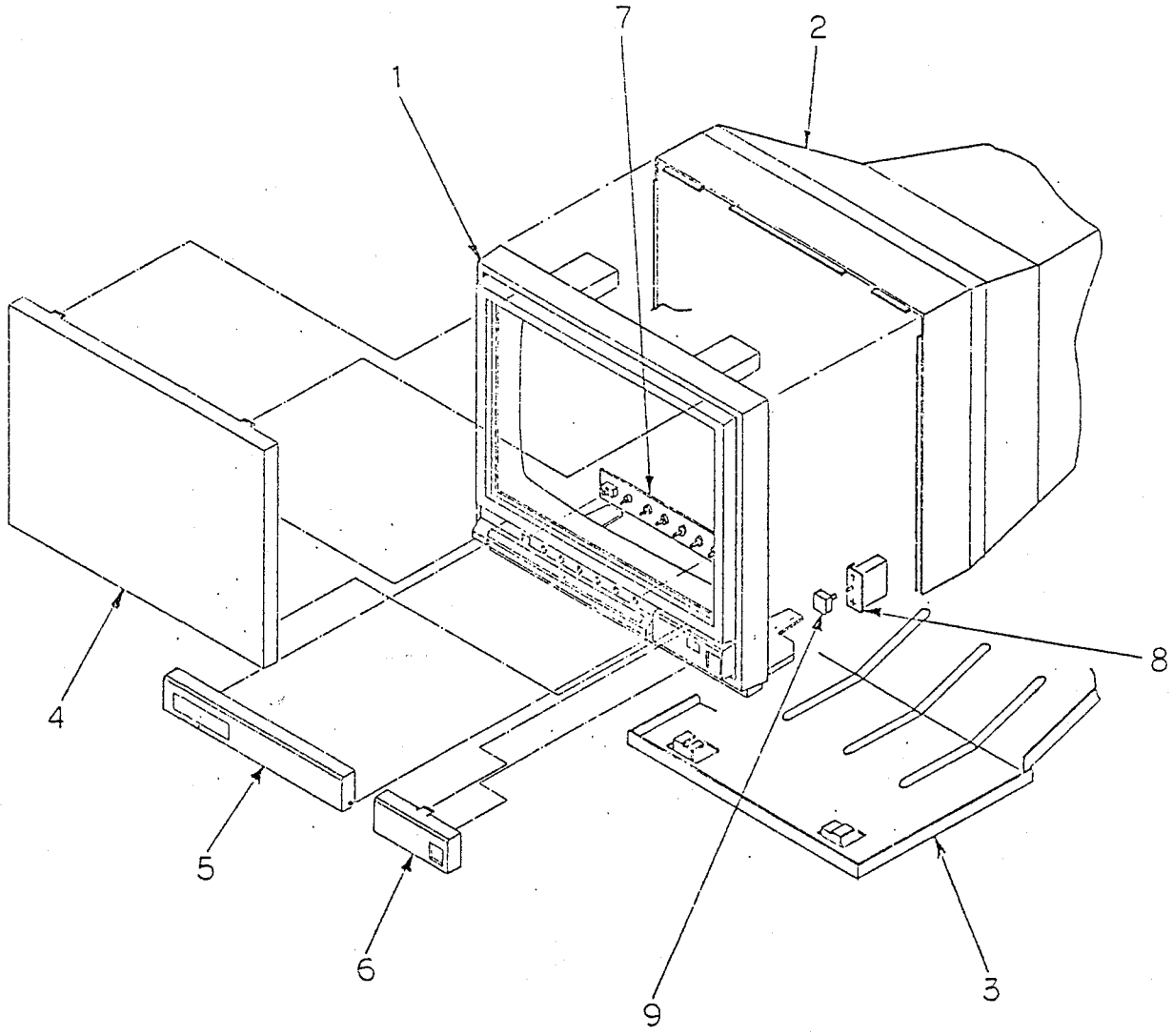
Schematic Location	Model No	Description
	TRANSISTOR (MAIN PCB)	
Q301	2SC2271D or 2SC2482 or 2SC2610	H.pre drive
⚠ Q302	2SD1397 or 2SD1426	H.drive.
Q501	2SC536KNP(F) or 2SC1815 or 2SC1740	
Q502	2SC536KNP(F) or 2SC1815 or 2SC1740	
Q503	2SC536KNP(F) or 2SC1815 or 2SC1740	
Q504	2SA1015Y or 2SA608NP	
	TRANSFORMERS	
T301	------	H.drive
T601	F291AN-0910N	Dlay
T602	F291AC-0911Z	Burst cleaning
T302	4455P00190A	Flyback transformers
⚠ T101	4129E00060	Power transformer
	FUSE (MAIN PCB)	
⚠ F101	ES3-2000	4.25A
⚠ F102	ES3-2000	4.25A

Schematic Location	Model No	Description	
		CAPACITORS	
		NOTES; All capacitors ±5% and 50 volts.	
		Materrials of Capacitors are abbreviated as follows;	
		Elect.....Electrolytic Capacitor	
		NP.Elect.....Non.Polarized Electrolytic Capacitor	
		Mylar.....Mylar Film capacitor	
		Polypro.....Polypropylene Capacitor	
		Ceramic.....Ceramic Capacitor	
		Tantal.....Tantal Capacitor	
C404	ECEA1HNKR33	Elect, 0.33uF	
C301	ECEA1HUR47	Elect, 0.47uF	
C406	ECEA1HUR47	Elect, 0.47uF	
C514	ECEA1HUR47	Elect, 0.47uF	
C611	ECEA1HN010S	Elect, 1uF	
C405	ECEA1HU0I0	Elect, 1uF	
C205	ECEA1HU4R7	Elect, 4.7uF	
C307	ECEA1HU2R2	Elect, 2.2uF	
C402	ECEA1HU3R3	Elect, 3.3uF	
C508	ECEA1VU4R7	Elect, 4.7uF 35v	
C409	ECEA1VU4R7	Elect, 4.7uF 25v	
C513	ECEA1VU4R7	Elect, 4.7uF 35v	
C316	ECEA1HU4R7	Elect, 4.7uF	
C206	ECEA1HU4R7	Elect, 4.7uF	
C109	ECEA1EU101	Elect, 100uF 25v	
C321	ECC-F1H3R3J	Elect, 4.7uF 160v	
C506	ECEA1CU100	Elect, 10uF 16v	
C319	ECEA1HN100	Elect, 10uF	
C318	SM160VB-10(M)	Elect, 10uF 160v	
C510	ECEA1CU330	Elect, 33uF 16v	
C511	ECEA1CU330	Elect, 33uF 16v	
C317	ECEA1CU470	Elect, 47uF 16v	
C416	ECEA1VU331	Elect, 330uF 35v	
C207	ECEA1HU470	Elect, 47uF	
C413	ECEA1VU101	Elect, 100uF 35v	
C202	ECEA1HU100	Elect, 10uF	
C204	ECEA1HU221	Elect, 220uF	
C203	ECEA1HU221	Elect, 220uF	
C315	ECEA1EU331	Elect, 330uF 25v	
C415	ECEA1EU471	Elect, 470uF 25v	
C606	ECEA1HKNOR1	Elect, 0.1uF (NP)	
C403	ECSF1CE105	Tantal, 1uF 16v	
C515	ECEA1EU471	Elect, 470uF 25v	
C401	ECQ-K1103JZ	Mylar, 0.01uF	
C308	ECQ-M1H153KV	Mylar, 0.015uF	
C408	ECQ-M1H153KV	Mylar, 0.015uF	
C303	ECQ-M1H333KV	Mylar, 0.033uF	
C302	ECQ-M1H473KV	Mylar, 0.047uF	
C304	ECQ-K1562JZ	Mylar, 5600P 100v	
C310	ECQ-F2474JZ	Mylar, 0.47uF 200v	
C201	ECQ-M1H223KS	Mylar, 0.022uF	
⚠ C312	ECQN-H1SH472JD	Polypro, 0.0047uF 1.5kv	
⚠ C313	ECQN-H1SH682JD	Polypro, 0.001uF 1.5kv	
C614	ECC-F1H270J	Ceramic, 27P	
C505	ECC-F1H270J	Ceramic, 27P	
C602	ECC-F1H470J	Ceramic, 47P	
C208	ECC-F1H102J	Ceramic, 1000P	
C411	ECC-F1H151J	Ceramic, 150p	
C504	ECC-F1H101J	Ceramic, 100P	
C615	ECC-F1H331K	Ceramic, 330p	
C616	ECC-F1H331K	Ceramic, 330P	
C617	ECC-F1H331K	Ceramic, 330P	
C509	ECK-F1H392KB	Ceramic, 3900P	
C507	ECC-F1H821K	Ceramic, 820P	
C412	ECK-F1H222KB	Ceramic, 2200P	
C320	ECQ-M1H682KZ	Ceramic, 6800P	
C410	ECK-F1H822KB	Ceramic, 8200P	
C309	ECK-D2H472KB2	Ceramic, 4700P 500v	
C621	ECC-F1H330J	Ceramic, 33P	
C622	ECK-F1H181KB	Ceramic, 180P	
C512	ECK-F1H221KB	Ceramic, 220P	
C407	ECK-F1H103MD	Ceramic, 0.01uF	

Schematic Location	Model No	Description	
C101	ECK-D2H472KB2	Ceramic, 4700P	500v
C102	ECK-D2H472KB2	Ceramic, 4700P	500v
C103	ECK-D2H472KB2	Ceramic, 4700p	500v
C104	ECK-D2H472KB2	Ceramic, 4700P	500v
C105	ECEA1CU471	Elect, 470uF	200v
C106	DM160VB-10(M)	Elect, 10uF	160v
C107	SM160VB-33(M)	Elect, 33uF	160v
C108	ECEA1EU102	Elect, 1000uF	25v
⚠ C111	ECQ-U2A473MV	Mylar, 0.047uF	250v
⚠ C112	ECQ-U2A473MV	Mylar, 0.047uF	250v
C501	ECK-F1H103MD	Cermaic, 0.01uF	
C503	ECK-F1H103MD	Ceramic, 0.01uF	
C601	ECK-F1H103MD	Ceramic, 0.01uF	
C603	ECK-F1H103MD	Ceramic, 0.01uF	
C604	ECK-F1H103MD	Ceramic, 0.01uF	
C605	ECK-F1H103MD	Ceramic, 0.01uF	
C607	ECK-F1H103MD	Ceramic, 0.01uF	
C608	ECK-F1H103MD	Ceramic, 0.01uF	
C609	ECK-F1H103MD	Cermaic, 0.01uF	
C610	ECK-F1H103MD	Ceramic, 0.01uF	
C110	ECK-F1H103MD	Ceramic, 0.01uF	
C613	ECK-F1H103MD	Cermaic, 0.01uF	
C618	ECK-F1H103MD	Ceramic, 0.01uF	
C321	ECK-F1H331MD	Ceramic, 330 pF	
		CONTROLS (MAIN PCB)	
R551	V8K4-11-50KohmB	50Kohm	
R553	V8K4-11-50KohmB	50Kohm	
R651	V8K4-11-10KohmB	10Kohm	
R652	V8K4-11-1KohmB	1Kohm	
R554	V8K4-11-30KohmB	30Kohm	
R451	V8K4-11-500ohmB	500ohm	
R452	V8K4-11-20KohmB	20Kohm	
R351	V8K4-11-5KohmB	5Kohm	
R453	TM10KPV1-500ohmB	500ohm	
TC601	ECR-HA050G11	35pF	
	or TZ032600	50p	
		INTEGRATED CIRCUITS	
⚠ IC101	STR3115		
	or 2SD1294		
	S1854		
IC201	uPC575C2		
⚠ IC301	M51384AP		
⚠ IC401	uPC1378H		
		COILS	
⚠ L101	SC-02-01H		
L301	------		
L303	EL0606-821	820u	
L501	EL0606-330K	33u	
L502	EL0606-5R6	5.6u	
L604	EL0606-5R6		
L602	EL0606-8R2K	8.2u	
DL1	CDL-1805A		
	or DL102 251D-1726		
DL2	PDL-643K		
	or PH404-1		

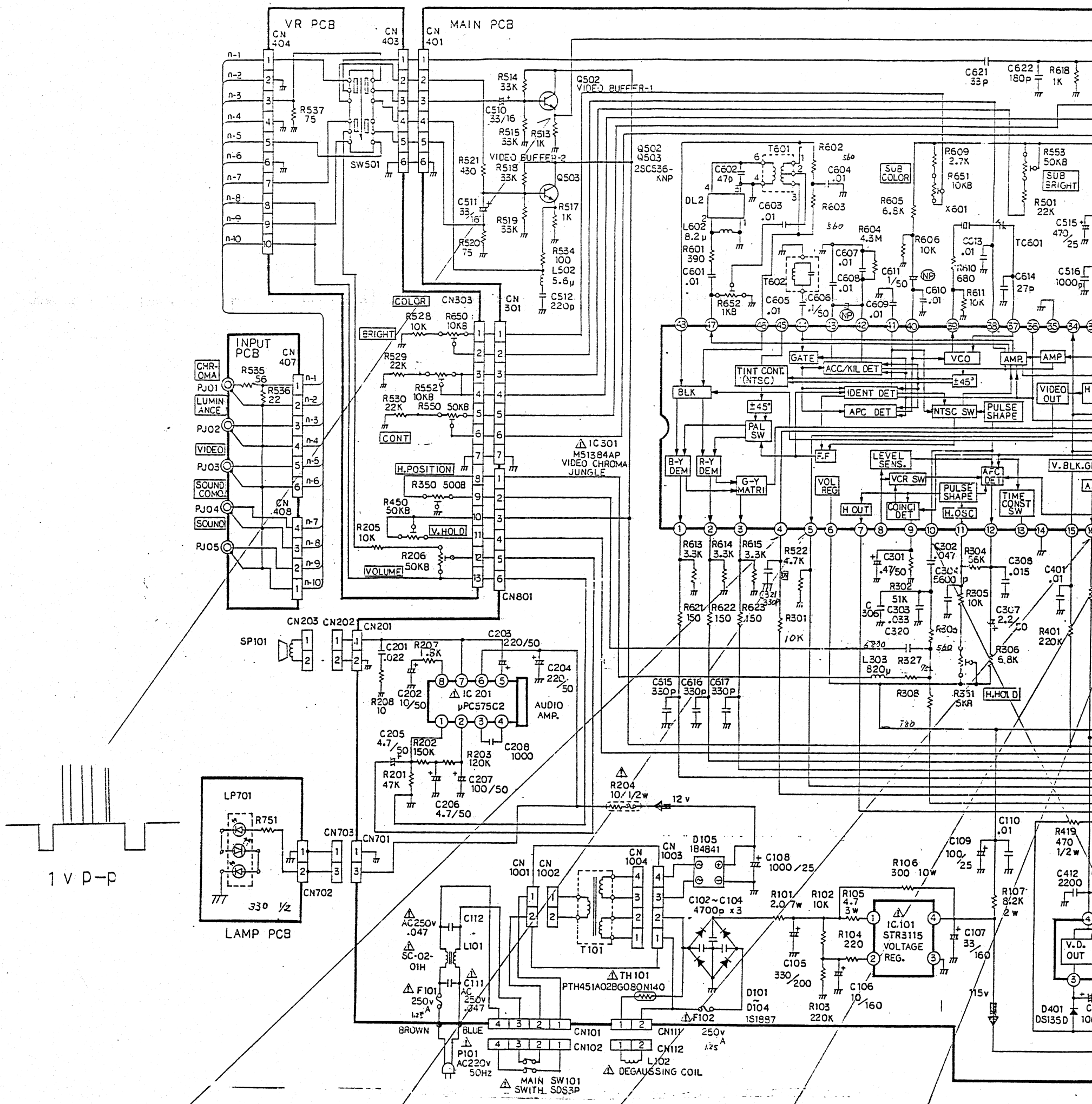
Schematic Location	Model No	Description
	RESISTORS	
R535	NAS1/4S220J	Carbon, 22ohm
R536	NAS1/4S560J	Carbon, 56ohm
R708	NAS1/4S471J	Carbon, 470ohm
R715	NAS1/4S102J	Carbon, 1Kohm
R716	NAS1/4S102J	Carbon, 1Kohm
R717	NAS1/4S102J	Carbon, 1Kohm
⚠R709	ERG2SJ123P	Metal Oxide, 12Kohm 2W (Fuse Resistor)
⚠R710	ERG2SJ123P	Metal Oxide, 12Kohm 2W (Fuse Resistor)
⚠R711	ERG2SJ123P	Metal Oxide, 12Kohm 2W (Fuse Resistor)
R712	ERC12GK332V	Resistor, 3.3Kohm 1/2W
R713	ERC12GK332V	Resistor, 3.3Kohm 1/2W
R714	ERC12GK332V	Resistor, 3.3Kohm 1/2W
R721	ERC12GK474V	Resistor, 470KOhm 1/2W
R704	V8K4-11-300ohmB	Resistor, 300B 0.1W
R705	V8K4-11-300ohmB	Resistor, 300B 0.1W
R718	V8K4-11-5KohmB	Resistor, 5KB 0.1W
R719	V8K4-11-5KohmB	Resistor, 5KB 0.1W
R720	V8K4-11-5KohmB	Resistor, 5KB 0.1W
R701	NAS1/4S221J	Carbon, 220ohm
R702	NAS1/4S221J	Carbon, 220ohm
R703	NAS1/4S221J	Carbon, 220ohm
R706	NAS1/4S331J	Carbon, 330ohm
R707	NAS1/4S331J	Carbon, 330ohm
	CAPACITORS	
C704	SM250VB-4R7(M)	Elect,4.7uF
C701	ECK-FHH 561KB	Ceramic, 560P
C702	ECK-FHH 561KB	Ceramic, 560P
C703	ECC-F1H 391	Ceramic, 390P
C705	ECK-D3F102KBN	Ceramic, 1000P
C706	ECK-F1H102KB	
C516	ECK-F1H102KB	
	TRANSISTOR	
Q701	2SC2068	
Q702	2SC2068	
Q703	2SC2068	

Schematic Location	Model No	Description
R528	NAS1/4S103J	Carbon, 10Kohm
R529	NAS1/4S223J	Carbon, 22Kohm
R530	NAS1/4S223J	Carbon, 22Kohm
R537	NAS1/4S750J	Carbon, 75ohm
R701	NAS1/2S331J	Carbon, 330ohm
R205	NAS1/4S103J	Carbon, 1K ohm
	CONTROLS	
R206	VE12CH230TSB503	50KB
R450	VE12CH230TSB503	50KB
R350	VE12CH230TSB501	500B
R550	VE12CH2U30TSB503	50KB
R650	VE12CH2U30TSB103	10KB
R552	VE12CH2U30TSB103	10KB



KEY NO.	PART NO.	DESCRIPTION
1		FRONT CABINET
2		BACK CABINET
3		CHASSIS
4		CRT COVER
5		V.R COVER
6		POWER SWITCH COVER
7		V.R PWB ASSY
8		HOLDER , POWER SWITCH
9		KNOB , POWER SWITCH

CIRCUIT DESCRIPTIONS



CRT PCB

CRT SOCKET HPS0171

CN-E

CN-E'

CRT ST-CM-B-22P

R

G

B

C705 1000 3kV

Q701~703 2SC2068

R.OUT Q701

G.OUT Q702

B.OUT Q703

R.DRIVE

G.DRIVE

B.DRIVE

R701 220

R702 220

R703 220

R704 300Ω

R705 300Ω

R706 330

R707 330

R708 470

R709 12K 2w

R710 12K 2w

R711 12K 2w

R712 3.3K 1/2w

R713 3.3K 1/2w

R714 3.3K 1/2w

R715 1K

R716 1K

R717 1K

R718 5KB

R719 5KB

R720 5KB

R.CUT OFF

G.CUT OFF

B.CUT OFF

C701 560P

C702 560P

C703 390p

C704 4.7/250

L701 270μ

R721 470K

SCRN EN

3 v p-p

40 v p-p

1.5 v p-p

CN603

CN601

CN 501

CN 503

GND

H.V. CAPACITOR C706

SW401

SCRN

R531 680

R532 330

Q504 2SA608-NP

VIDEO AMP.

R523 47K

R526 100K

D501 1S1553

R525 68K

C514 .47/50

R524 47K 1/2w

R321 120K

R322 470K

BEAM LIMITER Q501 2SC536KNP

180v

D305 03P2M

D304 05Z6.2Z

R323 1.8K

D303 TVR18

C316 4.7/50

C317 47/16

R324 LK

R325 1K

12v

D302 1S2776

R319 2.2 1/2w

R320 2.2

L304 8.2μ

C315 330/25

D301 1S2776

R318 2.2

R326 2.0 1/2w

T302 FBT

26v

C416 330/35

D402 EU2

R418 2.2 1/2w

C313 1000 1.5KVp-p

C312 4700 1.5KVp-p

H.OUT Q302 2SD1397

R309 560

R312 2.2

R310 4.7

T301

Q301 2SC2271D

R317 3.9K 3w

C309 4700p 500V

C318 10/160

R314 1K

C319 10/50 NP

R316 100K

R315 47K

CN 701

L301 C310 .47

R307 220 1/2w

H.DRIVE

D401 DS135D

C413 100/35

V.DRIVE IC401 μPC1378H

V.D. OUT

BOOSTER

PULSE WIDTH ADJ.

C110 .01

R107 8.2K 2w

R419 470 1/2w

R453 500B

C415 470/25

R416 470 1/2w

R415 3.9 1/2w

R417 470

C412 2200

C411 150

CN 901

CN902

V.DY

H.DY

1.5 v p-p

0.8 v p-p

C622 180P

R618 1K

L604 5.6μ

R551 50KB SUB CONT

R506 5.6K

R507 12K

R512 1.5K

C509 330P

R553 50KB SUB BRIGHT

R501 22K

R533 15K

C513 4.7/35

R509 1K

R511 180K

DL1

C508 4.7/35

C515 470/25

TC601

C501 .01

C503 .01

R504 10K

R508 1K

C505 27P

R510 470

C516 1000p

C614 27p

C618 .01

L501 33μ

C506

C507 820p

C504 100P 10/16

R510 470

VIDEO TONE CONT

SYNC. OUT

SYNC. SEP.

AMP.

VIDEO OUT

H V BLK/ WPL

PEDESTAL CLAMP

CONTRAST CONT

GATE PULSE

PULSE SHAPE

V. BLK. GEN.

AMP

RAMP GEN.

V.OSC

V. SYNC SEP

AFC DET

TIME CONST SW

R411 220

R410 150K

C409 4.7/35

C410 8200P

C408 .015

C407 .01

C405 1/50

R409 10K

R554 30KB TONE

C406 .47/50

R408 68K

R451 500B V. SIZE

R452 20KB V. LIN

C402 3.3/50

R405 150

R420 15K

R407 12K

R406 7.5K

C403 1/16

C404 .33/50

R403 560

R404 39K

R402 220

C401 .01

R401 220K

C308 .015

C307 2.2/50

R306 6.8K

H.HOLD